

NETWORK COORDINATION APPARATUS

FIELD OF APPLICATION

[0001] The invention relates to network coordination apparatus configured to configure one or more network entities, but not exclusively limited to configuring one or more network entities within an automated self organising network.

BACKGROUND OF APPLICATION

[0002] A communication system can be seen as a facility that enables communication sessions between two or more entities such as mobile communication devices and/or other stations associated with the communication system. A communication system and a compatible communication device typically operate in accordance with a given standard or specification which sets out what the various entities associated with the system are permitted to do and how that should be achieved. For example, the manner how the communication device can access the communication system and how communications shall be implemented between communicating devices, the elements of the communication network and/or other communication devices is typically defined.

[0003] In a wireless communication system at least a part of communications between at least two stations occurs over a wireless link. Examples of wireless systems include public land mobile networks (PLMN), satellite based communication systems and different wireless local networks, for example wireless local area networks (WLAN). In wireless systems a network element or network entity (NE) or access node is provided by a base station. The radio coverage area of a base station is known as a cell, and therefore the wireless systems are often referred to as cellular systems. In some systems, for example a 3GPP standard system, a base station access node is called Node B (NB) or an enhanced Node B (eNB).

[0004] A user can access the communication system by means of an appropriate communication device. A communication device of a user is often referred to as user equipment (UE). A communication device is provided with an appropriate signal receiving and transmitting arrangement for enabling communications with other parties. A communication device may be arranged to communicate, for example, data for carrying communications such as voice, electronic mail (email), text message, multimedia, for enabling internet access and so on. Users may thus be offered and provided numerous services via their communication devices. The communication connection can be provided by means of one or more data bearers.

[0005] In wireless systems a communication device provides a transceiver station that can communicate with the access node and/or another communications device. A communication device or user equipment may also be considered as being a part of a communication system. In certain applications, for example in ad-hoc networks, the communication system can be based on use of a plurality of user equipment capable of communicating with each other.

[0006] Network management is a complex task. Complexity arises on the one side from the number of network elements (NEs) that have to be deployed and managed, and on the other side from interdependencies between the configuration and the status of the deployed network elements in terms of performance, faults, etc. In a heterogeneous network the variety of deployed technologies and their proprietary

operational paradigms are difficult to handle. The configuration, optimization and troubleshooting of the management of the network therefore requires high expertise and operational management workflows to be typically performed by human operators supported by software tools. However, such manual and semi-automated management is time-consuming, error-prone, and potentially unable to react quickly enough to network changes and thus expensive.

[0007] It has been a goal of network management designers to attempt to automate operation, administration and management (OAM) functions by the deployment of "Self Organizing Networks" (SON). While SON concepts are generically applicable, these focus of developments has been to Radio Access Networks (RAN) due to the large number of NE (base stations) distributed over large geographical areas (and thus the incurred cost to doing remote and on-site management activities). In particular, for the long term evolution (LTE) and long term evolution-advanced (LTE-A) radio access network (RAN) standards such as evolved universal mobile telecommunications system (UMTS) Terrestrial Radio Access Network (E-UTRAN), SON is considered a crucial building block, due to the anticipated high degree of distribution and heterogeneity. In other words in such networks there is expected to be a wide range of telecommunications standards being employed such as concurrent operation of 2G/3G/LTE/LTE-A network elements. Furthermore the LTE networks are believed to also be heterogeneous in structure, for example employing LTE multi-layer structures where there can be pico cells, micro cells, and macro cells all operating over the same geographical range.

[0008] Typically the SON is controlled by the application of SON functions which monitor, plan and enforce control over network elements. However because the execution of SON functions is individual and dynamic (i.e., not pre-planned), the application of SON function instances can have run-time interactions with other SON functions instances. A "negative interaction" is called a "conflict".

[0009] Conflicts are generally to be avoided.

[0010] Embodiments of the invention aim to address one or several of the above issues.

STATEMENT OF APPLICATION

[0011] In accordance with an embodiment there is provided a method comprising: determining at least one event criteria from a received event function request; determining an event impact from the at least one event criteria and a general function impact; determining whether the event impact interferes with at least one implemented function instance; and generating a coordination output based on the determination whether the event impact interferes.

[0012] Determining at least one event criteria may comprise determining at least one of: an event type; at least one parameter associated with an event type; an event area; and an event time.

[0013] The method may further comprising storing the at least one event criteria.

[0014] Determining an event impact may comprise: determining a general function impact based on at least a part of the at least one event criteria; and determining an event impact based on the general function impact and a further part of the at least one event criteria.

[0015] The event impact may comprise at least one of: an event impact area; an event impact time; an event impact safety area; and an event impact safety time.